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## United States Department of Agriculture,

## DIVISION OF ENTOMOLOGY.

## THE PEACH-TREE BORER.

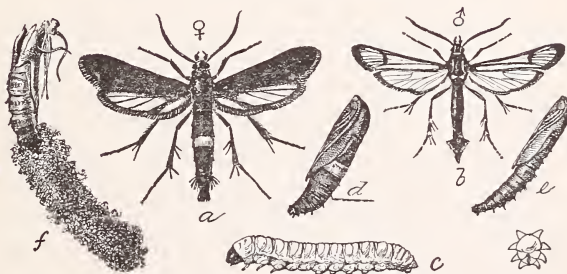
*(Sannina exitiosa Say.)*

FIG. 1.—*Sannina exitiosa*: a, adult female; b, adult male; c, full-grown larva; d, female pupa; e, male pupa; f, pupa skin extruded partially from cocoon—all natural size (original).

## GENERAL APPEARANCE AND METHOD OF WORK.

The brownish, gummy exudations, more or less soiled with earth and the larval excrement, about the bases of peach trees, and also, to a less extent, of the cherry and plum, are familiar to all growers of these fruits. These exudations indicate the presence of the peach-tree borer, which undergoes its development just within the bark, mining between the bark and the sapwood, often completely girdling and causing the death of trees, and always greatly injuring and weakening them. The parent of this larva is not often seen. It is a very slender, dark-blue moth, wasp-like in appearance, and presenting remarkable differences between the two sexes. The mimicking of the wasp is especially noticeable in the case of the male insect, the wings of which are transparent, bordered with steel-blue, which is the general color of the body in both sexes. The fore-wings of the female are blue and clothed with scales, while the hind-wings are transparent, resembling those of the male. The middle of the abdomen of the female is marked by a broad orange band. The male expands about one inch and the female an inch and a half or more.

## ORIGIN AND DISTRIBUTION.

This insect is a native American species, and was described by Thomas Say, of Philadelphia, early in the present century. Its food plant prior to the introduction of the peach by Europeans was undoubtedly some of the wild plums, and the fact that this country is its native home easily explains its present wide distribution. It occurs practically wherever the peach is grown throughout the United States, our records covering the country from Maine southward to the Gulf and westward to the Pacific Slope. Naturally, its presence is most noticeable in the districts where peach growing is a prominent industry, notably in Maryland and Delaware, and from Michigan southward throughout the upper valley of the Mississippi and its tributaries.

## NATURAL HISTORY AND HABITS.

There is but one generation of larvæ annually. The moths appear as early as May in the latitude of Washington, D. C., and southward, over what approximates the lower austral region. In the upper austral region, roughly comprising the States above the cotton belt and below the northern tier, the moths do not appear until after the middle of June. In the transition region, which comprises the northern tier of States, together with most of New York and New England, the moths appear chiefly in July and later, emerging, however, as early as June, and belated individuals as late as October. June and July are therefore the worst months for the moths over the principal peach districts.

The egg is deposited on the bark, usually at or near the surface of the ground, although rarely it may be placed well up on the trunk or in the crotches of the larger branches. The egg is very minute, not exceeding 0.2 mm. in length, oval, yellowish brown in color, and irregularly ornamented with hexagonal sculpturing. The young larva on hatching is very active, and immediately burrows into the bark, usually entering at cracks. Having worked its way to the sapwood, usually near or below the surface of the ground, it feeds steadily through the balance of the summer and well into the fall, constantly enlarging its excavation, and causing the exudation of the gum, intermixed with excrement and fragments of bark, which is so characteristic of its presence. It remains dormant in the larval state during winter and resumes feeding again the following spring, reaching full growth in the central districts by the middle of June. It transforms to chrysalis within an elongate, cocoon-like cell constructed of its own frass and particles of bark attached with gum and threads of silk. The moths emerge very shortly after the chrysalis state is assumed, usually only a few days intervening. The males appear a few days earlier than the females.

The full-grown larva attains a length of about an inch, is rather robust, of a yellowish white color, with head and first segment brown.



## PREVENTIVES AND REMEDIES.

There are two principal methods of preventing injury by this insect, viz: (1) means, mechanical and other, designed either to keep the female moth from depositing her eggs on the trees or at least to prevent the young larvæ from effecting an entrance into the bark: and, (2) applications to the trunk, which will poison the larvæ in eating in from the outside. All of these preventive measures must be attended to before the emergence of the parent insect, which will vary as indicated in the different latitudes.

There is no better mechanical protection than the one recommended by Harris in 1826, which consists in removing a little of the earth from about the base of the tree and surrounding the trunk with a strip of sheathing paper eight or nine inches wide, and extending 2 inches below the soil, secured with strings above, and by replacing the soil about the trunk below. The wrappings may be removed in winter and renewed in June. A more durable sheathing for the trunk, described by Dr. Lintner, is one of fine wire netting. Cylinders of this wire 15 inches long can be secured, it is stated, for about \$12 per 100. Rye or other straw may be bound about the trunks of the trees or any similar material may be used as a means of mechanical protection. An old remedy consists of mounding up earth a foot or so about the trunks with the same object in view. In late years very good success has been had by coating the trunks with a heavy whitewash, which may be made more tough and persistent by the addition of a little glue or soft soap. All of these applications should extend from a few inches below the surface of the ground upward to a height of one foot to eighteen inches. In the case of the lime coatings the applications may extend up to the lower branches. A protective measure, which has very recently been tried successfully in New Jersey (Smith), is in the use of insect lime, either of domestic manufacture or foreign brand, applying it in a coating about three-sixteenths of an inch thick to the trunks of the trees from the ground to the branches, first preferably scraping off the loose bark.

Somewhat allied to mechanical protections are applications to the trunk which are obnoxious to the moths and which may prevent them from ovipositing. Carbolic acid washes are perhaps the best for this purpose, and various formulas have been given. Dr. Lintner quotes Mr. Batesman, of Painesville, Ohio, as having had good success with the following wash:

One pint of crude carbolic acid or one-half pint of refined acid, combined with a gallon of good soft soap, and the whole diluted with the addition of 8 gallons of soft water. The wash is applied thoroughly with a brush, care being taken to wet all the crevices.

The following similar wash is recommended by Mr. J. H. Hale, the well-known peach grower of Connecticut:

Two quarts of strong soft soap and half a pint of crude carbolic acid, with 2 ounces of Paris green, are thoroughly incorporated in a bucketful of water and enough lime and clay added to make a thin paste.

The application of poisons to the trunk is a more recent practice, and seems to have been first recommended by Mr. W. H. Ashmead in 1888, in the suggestion of a strong soap wash, combined with Paris green or London purple; a preferable wash, and one now usually recommended, is an admixture of an arsenical with the lime coating referred to above, using two or three ounces of poison with every pailful of the whitewash. The advantage of the poison is that it effects the destruction of any larvæ which may succeed in penetrating the lime. The application recommended by Mr. Hale is allied to the last. The best of the foregoing preventives are the mechanical protections and the lime-arsenical washes. The carbolic-acid wash can not be so thoroughly relied upon.

The measures given above are protective, and do not apply to the larvæ already in the trees. Protected as these larvæ are by the covering bark and exudations of gum, they are out of the reach of poisons, and there is nothing to do but to cut them out with a knife. They may be easily found and, with a little care, removed without injuring the tree. The adoption thereafter of one or the other of the means already described should prevent the trees from again becoming infested, but should this in any case occur, the knife should be promptly used.

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